

GOVERNMENT INVESTMENT POLICY AND INCOME DIFFERENCES

IN CHINA

by

JIE YANG

B.A., Beijing Languages Institute, 1983

A MASTER'S THESIS

submitted as partial fulfillment of the
requirements for the degree

MASTER OF ARTS

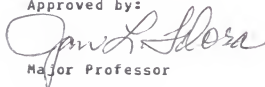
Department of Sociology, Anthropology
and Social Work

KANSAS STATE UNIVERSITY

Manhattan, Kansas

1989

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Acknowledgements

This thesis is dedicated to my mother to whom I owe my life

I would like to take this opportunity to express my gratefulness to Jan Flora, Scott Frey and James Miley who have made generous contributions to my study. I would also thank Tin-yu Ting and Dennis Roncek for their valuable guidance.

A word of thanks is also due to wei Yuan who had helped me in numerous ways. Finally, my thanks to my friends and colleagues for their encouragement.

Chapter 1

INTRODUCTION

Purpose and Significance of the Study

The main purpose of this study is to determine the effect of central government investment policy on provincial income differences and changes in China from 1981 to 1986. Central investment policy is considered the most important influence on income variation, since most income-generating sectors of the economy are still centrally controlled. The effects of other geographic and economic factors on income change will be controlled.

Since 1949, it has been repeatedly claimed by the Chinese government that one of the main tasks of socialist revolution is to narrow three major differences: the differences between workers and peasants, between city and countryside, and between mental and manual labor (Hua, 1975). An important means of reducing such differences is through the development of the national economy. Over the last thirty-five years, the country's economy has improved greatly. Yet, regional income differences persist despite efforts to eliminate them. Whether such differences can be reduced and eventually eliminated under current economic policy in China is still uncertain.

The Chinese central government has exclusive control of the country's natural resources and, to a large extent, its

labor resources. It also possesses the power to manipulate other factors like market prices, food subsidies and the salary system to fulfill its own political purposes. Hence, the government has the capacity to reduce income differences between rural and urban residents although perhaps at the expense of economic efficiency or speed of economic growth.

Beginning in 1979, there have been reforms in China's economic framework. Such changes have been rapid in the agricultural sector, but slow in others, especially in the core industrial sector of the economy. Due to the fact that the reform is designed to occur in several phases with each phase emphasizing different economic sectors (e.g., agriculture in the initial phase, which began in 1979), the speed of economic changes for different groups of people will vary. Thus, income distribution patterns change both within and across provinces. Undoubtedly such changes will have great social and economic impact. Many previous studies had focused on the effects of economic and political reforms on the nation's economy, which is indeed a very important topic. However, it is necessary to carry these efforts one step further by studying how people's income levels change during the reforms and what is the role of central government in such changes.

A brief study of the 1983 national census (which covered the whole population of China) shows that significant differences exist when average provincial income levels are

compared. Some logical questions are: How does central government policy toward regional economic development contribute to changes in income levels in various provinces? Is there a narrowing or widening of income differences between city residents and rural residents as a result of higher levels of government investment? Are there any factors other than central government policy that may affect income changes?

Given the fact that income data on a regional level has only recently become available, this thesis should provide useful information on how central government investment policy is related to actual income changes for various groups of people in each province. The results may suggest ways in which the government could modify its investment policy to reduce income differences.

Summary and Overview

The distribution of resources by the central government within and among the provinces plays a key role in affecting differences in per capita income for different categories of people. This thesis will examine the impact of central government investment on changes in income differences among and within China's provinces. It should contribute to a better understanding of such governmental roles in China and will thereby fill a gap in research on income differences in China.

Chapter 2 contains a discussion of the theoretical background for central policy making, a discussion of effects of Five-Year-Plans on income, and an overview of previous research on income differences in both capitalist and socialist countries. The data and method of the research are discussed in Chapter 3. The findings are presented in Chapter 4. Chapter 5 contains major conclusions and a discussion of the significance of the findings.

CHAPTER 2

THEORETICAL BACKGROUND AND PREVIOUS RESEARCH

One topic of traditional sociological concern is the pattern of and changes in income distribution which respond to different variables in capitalist and socialist countries. Many studies have been conducted on income inequality in capitalist countries, but few in socialist countries. The first part of this chapter focuses on discussions of historical changes in central government investment policy, beginning with a brief review of the Marxist model of socialist societies followed by a discussion of the Five-Year Plans before 1980, with emphasis on changes in inland vs. coastal and rural vs. urban investment patterns. The second part of this chapter begins with a review of studies conducted in capitalist countries. That is followed by a review of relevant studies of economic and social changes in China.

The Marxist Model of Socialist Societies

Marx predicted the inevitable breakdown of capitalism through revolution led by the working class. Such common characteristics as class exploitation, class conflict, production for profit instead of need, the human waste

resulting from mass unemployment as well as massive waste of natural resources in unplanned production would be adjusted or eliminated in a socialist society. In such a society, (1) public ownership of the means of production and distribution would be instituted to assure disappearance of exploitation and of boundaries between economic classes; (2) government would take on an administrative role of planning for production around the goal of common consumption rather than the repressive role of safeguarding the power and privileges of the ruling class, and (3) with the disappearance of private property, inequality of all kinds would gradually be brought to a minimum level (Abercrombie, Hill and Turner, 1984). Although Marx did not draw an explicit picture on how such a society should operate, he did predict the superiority of the socialist system over the capitalist system in the sense that the former could make more meaningful and efficient use of its natural and human resources, and the social products would be equally distributed among its members.

However, socialist nations throughout the world have embarked on a tortuous road. Leaders of different socialist countries with varying backgrounds have conceptualized Marx's model differently. Actual practices diverge even more widely. One common characteristic of these socialist countries is a largely planned and centralized economy. Some economists have studied central-government investment policies in socialist countries. In a study of Poland,

Wolkowiak (1983) indicated that the economic growth rate changed according to changes in amount of government investment. The distribution of such investment to different areas reveals the government's economic emphasis. This is probably also the case in China.

Since the early 1970s, several socialist countries in Eastern Europe have initiated economic reforms which, to a very limited extent, were followed by reforms in political structure. In Hungary and Yugoslavia, market mechanisms were incorporated into their planned economies in order to improve productivity and efficiency. While the market is still far from a free market, it provides an economic alternative, making the centrally planned economy less compulsory and rigid (Bauer, 1983). Such limited experiments have generated many changes. Hungarian agriculture particularly benefited from it. Although still collectively owned, individually operated Hungarian farms can make their own decisions and profit from good performance. The resultant increased agricultural productivity has reduced urban-rural differences in standards of living (Chirot, 1987). Other socialist countries like Poland and the Soviet Union are more cautious in their experimentation. Centralized economic planning is still dominant in these countries.

The purpose of this thesis is neither to define types of socialist systems, nor to determine if China fits the Marxist

model of socialism described above. Given that public ownership has been dominant in China and the country's economy has been under central planning for nearly forty years, I intend to examine how government investment policy, which is the major instrument of central planning, is affecting provincial income changes for urban and rural residents. To do so, it is necessary to study how central planning and central government investment have affected local economies which may consequently determine local income levels in China.

Retrospective on Five-Year Plans

The change in and controversies surrounding Chinese government policies in different historical periods since 1949 have focused mainly on two issues: 1) the balance between agricultural and industrial development, and 2) the balance between inland and coastal areas development. These two issues are closely related and sometimes conflict with each other. The relative emphasis on the two issues since the coming to power of the Communists can be best viewed through the Five-Year Plans.

When China established a socialist republic, there was no existing socialist model from which to make adaptations, except that of the Soviet Union. Mao Zedong had intended to establish a creative model fit for China's situation of widespread poverty, a small scientific and technological base, and underdeveloped industrial and urban centers.

Nevertheless, dependence on Soviet financial and technological input quickly helped China fall into the bureaucratized Soviet model. This set the tune for the coming five-year development plans as shown in Table 1.

The governmental imbalance in its investment between the industrial and agricultural sectors varied from one economic development period to another after 1949. However, investment in agriculture never reached half the level of heavy industry and, during two five-year plans, was as little as one fifth. After three years of readjustment of economic structure, which included land reforms in large agricultural areas and co-management of industrial enterprises previously owned by private capitalists, the Chinese started their first Five Year Plan (1953-57). The plan was based on the Soviet model in the belief that socialism should embody a high level of industrialization and large scale agricultural production. During this period, central government policies dominated changes in regional economic development. The industrial sector attracted most of central investment, which amounted to six times as much as that going to the agricultural sector. Marc Blecher (1985:54) characterized the policies of this period in the following way: a) highly centralized planning; b) the "economy was administered by vertically organized government ministries, with almost no role for horizontal coordination by local or regional political authorities"; c) investment priority was given to heavy industry while

agriculture was left to fend for itself. These policies tended to intensify the imbalance between the agricultural and urban sectors.

However, the policy of the same period also sought to correct the unequal distribution of industrial centers among coastal and inland areas (Roll and Yen, 1975). As a result, two thirds of the major new industrial projects were located in inland areas. New industrial centers in the interior could be more easily protected from the danger of foreign invasion. Such threat mainly came from Taiwan and the United States along the coastal areas in the 1950s and early 1960s, and from the Soviet Union from the north in the late 1960s and early 1970s. As a result, many new industrial projects were moved to inland areas despite the inconvenience. From 1952 to 1955, metal-processing industries in the inland areas increased 150%, while the same industries in coastal areas only experienced a 89% increase. Meanwhile, rapid increases in agricultural production, mainly due to the strong work incentives evoked by land-reforms and more favorable prices paid by the government for products produced by the peasants, also cushioned the effects of overemphasis on industrialization. During the period of 1952-58, average income for workers increased 47%, and for peasants 43% (National Statistics Bureau, 1960). The net increase in peasants' income due

Table 1
Investment For Basic Construction in Agriculture, Light
Industry and Heavy Industry, China, 1953-1980

	absolute investment (in 100 million Yuan)*			% of total investment		
periods	agri- culture	light ind.	heavy ind.	agri- culture	light ind.	heavy ind.
FYP-I (1953-57)	42	37	213	7	6	36
FYP-II (1958-62)	136	77	652	11	6	54
1963-65	74	16	194	18	4	46
FYP-III (1966-70)	104	43	499	11	4	51
FYP-IV (1971-75)	173	103	875	10	6	50
FYP-V (1976-80)	246	156	1075	11	7	46
1980**	52	51	225	9	9	40

Source: PRC.: National Statistics Bureau. 1987:477

FYP: Five Year Plan

*: Figures shown in this table are sums of the
entire period

** : Figures for 1980 are parts of FYP-V

to price changes from 1953-57 was 805 million yuan, using a 1952 yuan base (Chen, 1967). Even though the data are not per capita figures, they still reflect the government's efforts to fund agricultural programs by increasing purchasing prices for agricultural products.

In some respects, the second Five Year Plan was a continuation of FYP-I. As shown in Table 1, the industrial sector still attracted most of the central investment. FYP-II put more emphasis than did FYP-I on medium and small-scale factories and called upon a massive movement, the Great Leap Forward, to accelerate the speed of industrialization. During the process, provincial governments took over some of the medium-sized and most of the small factories, aiming at the improvement of efficiency. But the movement quickly went out of control: irrational and wasteful exploitation of local resources, low efficiency, uncoordinated all-out industrialization efforts in virtually every field, and over-investment during the Great Leap Forward period (1958-60) led the movement to a disastrous failure. The movement also had considerable negative effects on agricultural production, which left the government unprepared when serious drought, floods and a plague of locusts hit the country in three successive years starting in 1960 (Liu 1986; Blecher 1985). As Chirot noted:

The peasants suffered and starved, and a large, relatively inefficient heavy industrial sector was built by taking produce from the peasants to feed the cities

and factories. In return, the peasants were forced into collective arrangements that simply made it easier for the government and Party to control them. From 1957 to the 1960s, rural per capita food consumption fell by 24 percent, but urban food consumption fell by only 2 percent, so that by 1960 the cities were much better fed than the countryside.
(1987:276)

The following five-year plans did not substantially change the investment ratio between industry and agriculture. The only exception was the period 1963-65 when the Soviet Union abruptly withdrew its engineers, machines and investment due to the breakdown of the Sino-Soviet relationship. Also, three consecutive years of natural disasters struck China. Investment shifted significantly in favor of the agricultural sector during this period but still remained far behind investment in the industrial sector.

Compared with the investment ratio between industry and agriculture, the shift in government emphasis on development in coastal or inland areas is more frequent and noticeable. Coastal areas were given more attention and government investment during the second FYP. Such a shift was enhanced by the Soviet withdraw of its aid, since new industrial projects started with Soviet capital and technology relied, more than ever, on technological input from coastal industrial centers. However, the tension along the Sino-Soviet border in the late 1960s disrupted this trend: new industrial projects were moved to the interior as a preparation for war (Roll and Yeh, 1975). The industry-

agriculture investment ratio and the relative emphasis given to inland vs. coastal development have been two major concerns of Chinese policy makers since the founding of the PRC.

After Mao's death in 1976, more pragmatic leaders seized power. Reevaluation of the previous economic policies led to a period of extensive reforms which involved fundamental ideological changes. Some Chinese scholars proposed new assumptions: 1) Within the stage of socialist society, there can be sub-stages, the length of which vary in different countries. China's socialist society grew out of semi-feudal and semi-colonial patterns. Its productivity level is still very low; thus, a preparatory stage is needed to greatly increase productivity. It can also be a time for the government to acquire planning and management skills and experience. 2) Within these sub-stages, especially in a young socialist society, diversified development models should be explored. This may include both private and public ownership, a market economy and central planning, self-reliance and international cooperation, as well as decentralization of administrative power. 3) Communist society should not be seen as the ultimate stage of social development. Society is defined in terms of a continuous process. If communist society could ever be achieved, the form of society which would follow is not defined. It is acknowledged that society will go on developing to meet the needs of humankind. These assumptions provide a theoretical

basis for present flexible state policies.

Rapid economic development is emphasized and practical measures to facilitate such development have been adopted. These include decentralization of decision-making powers to the provincial or even lower levels so that local resources can be better used, introduction of the responsibility system to the countryside to give people incentives to work harder, and an open-door policy to encourage international cooperation. Due to the open-door policy and a new emphasis on the economic growth rate, it is proposed that coastal areas be emphasized again. Since 1979 there have been many economic and social changes.

Because of increasing work incentives, stimulated by the newly installed responsibility system, agricultural productivity shot up dramatically. Newly accumulated capital and farm labor were directed by both central and provincial governments to agricultural production and small-scale agriculturally related industrial production. Another round of localized industrialization occurred. However, state ownership of the means of production was still the dominant form and continued to play a major role in the country's economy through the year 1986, the end point of this study. Central government investment policy is still the major factor to study when examining provincial income levels.

Western Analyses of Income Differences in Capitalist

Societies

In studying income differences in China, it is important to examine the works of western social scientists regarding inequalities in their own countries to determine if their concepts are relevant to a socialist society. There have been many efforts to determine sources of income differences in western societies. In an effort to locate structural sources of income inequality in the United States, Kalleberg, Wallace and Althauser (1981) used measures of capital concentration, capital intensity, state sponsored production, size of establishment, and economic scale, as well as workers' power to account for unequal distribution of resources. They also incorporated into their study the educational levels of workers when analyzing various organizational and industrial situations. It was assumed that level of education of individual workers would also affect their income levels. Others, like Tolbert, Horan, and Beck (1980), and Stolzenberg (1978), studied income inequality in terms of organizational stratification.

Many researchers relate people's positions in the economic structure to income inequality: whether they own their businesses or have to sell their labor is one way of examining income inequality (Coverman 1983; Jacob 1983). But owner vs. worker status is not very relevant for income inequality studies in China. Most of the Chinese business enterprises, either under central or provincial governments,

or under lower levels of administration, are state owned or collectively owned (especially true before 1980). People's incomes varied in a very limited range according to educational background, work experience and years of service. Before 1980, nearly everyone was an 'employee' of the system rather than of any individual or firm able to take advantage of the ownership system.

Capitalist societies usually have considerably less direct government involvement in economic life than do socialist countries. Although multinational corporations and organizations of enormous size dominate national economies in some countries, their influence on economic policies are only indirect. It is difficult for them to directly guide national economic development.

Capitalist countries have a much higher social mobility rate than does China. People enjoy comparatively more freedom to choose occupations which best fit their knowledge and talent acquired through education and work experiences. Furthermore, there are basically no limits on domestic migration; hence, direct government control over regional income differences is very limited, even though such differences do exist in capitalist societies. One may conclude that in capitalist societies, characteristics of individuals such as education, migratory behavior, and occupation play a greater role in income distribution, while in socialist countries, government policy and other macro-

level variables will be more important determinants of income differences.

Although studies of western countries help to identify some possible contributors to income differences, the social contexts in which they were conducted still greatly limit their generalizability to socialist countries. These western analyses are deeply rooted in the context of a firm-centered capitalist economy, where industrial and agricultural production as well as commodity distribution occur through a set of impersonally defined and competitive social institutions which in turn organize a variety of specialized occupations, again, on a competitive basis. Such corporate system analysis can only be used analogically in China because of china's high level of centralization and state ownership. Factors such as capital intensity, size of establishment and economic scale do have certain effects on income variation, but the functions of these factors and the ways in which they relate to production and, eventually, to income differences between provinces are highly manipulated by the central government through controls on capital supply, the raw-materials rationing system, commodity markets and prices, and the salary system. Competition plays a much smaller role and in no way dominates commodity and labor markets in China. These contextual conditions suggest that the central government still retains its decisive power to influence income distribution, especially at a macro or provincial level in

China, and such power is often reflected through policies which are embedded in its political, ideological, and economic systems.

Empirical Studies Focused on China

There have been many studies of social change and development in China, but few which emphasize the impact of development on income differences. Besides the traditional focus on natural geographical resources in studying the local economy (Fei 1946; Petrov and Liu 1983), some scholars based their studies on other aspects, like political considerations in economic development (Emery 1966; Roll, Jr. and Yeh 1975), and the urbanization process (Leung and Ginsburg 1980; White and Parish 1984). But very little effort has centered on determining the effects of central policy on cross-province or intra-province income differences.

An exception is the work of Roll and Yeh (1975) which discusses China's regional economic development policies in coastal and inland areas in the 1950s. Policies of this period greatly favored the inland areas for three reasons: 1) the coastal areas with highly concentrated industries were vulnerable to foreign invasion; 2) eliminating regional inequalities was considered very important ideologically; and 3) a more balanced distribution of industrial centers would reduce the pressure on transportation (then very backward). This kind of policy,

of course, sacrificed, to some extent, the speed and efficiency of economic development. Roli and Yeh also discussed the fluctuation of government policies during the 1960s and early 1970s. They used population and its change as indicators of policy changes in these areas, but this method may not be very effective or accurate since population movement was tightly controlled in China through a complex registration system. In my study, I will borrow their concepts of inland and coastal areas simply to reflect different levels of historical and geographical economic development efforts.

Stack (1978) pointed out that "the degree of direct government involvement in the economy is the single most important factor associated with low income inequality" (1978: 880). In other words, high government involvement in the economy can significantly lower income inequality. And "this relationship is independent of both the level of economic development and the rate of economic growth" (Stack, 1978: 880). It is proposed that central government investment in the local economy is the single most important factor influencing regional income variations in China. Halpern (1985) studied the resources behind China's present policies. While searching for ways to improve economic performance, Chinese leaders after Mao advocated studies of foreign experiences, especially those of the Eastern European countries, as sources of information for developing policies.

Perhaps the most relevant dimension for assessing income differences in China is the two types of citizenship. They have the effect of placing people in different positions in the economic structure. One type of citizenship is for people who live in cities and towns and work for wages; the other is for peasants who live in the countryside and earn their living mainly by producing agricultural products. Peasants cannot live and work in cities except on rare occasions like being enrolled as college students or being employed by a new factory. These changes, however, are possible only after obtaining permission at various administrative levels. It is difficult for peasants to become city residents, who generally have a higher standard of living. Since opportunities for changing to urban citizenship are rare, competition for the few positions is keen. City residents enjoy a guaranteed salary, government subsidized food, and other social benefits like free medication, better educational conditions, retirement pensions, etc. Their average income, at least until recently, has been considerably higher than that of peasants. Thus, the worker-peasant dimension represents substantial income differences. In my study, the combined and separate effects of central policy on average income will be examined for both city residents and residents in the countryside.

Conclusions

Several conclusions emerge from this chapter: 1) those studies done in Western capitalist contexts do not supply readily applicable models for similar studies in China, though they are suggestive in locating possible contributors to income changes. 2) An overall synthetic study of regional income differences in China which includes central government investment policy as a causal variable has not been conducted. 3) Recent changes in policies have not been fully incorporated into studies of regional income distribution. A brief historical review of central policies was conducted in order to better understand the impact of such policy changes on income variation. 4) Coastal-inland and industry-agriculture differences in government investment are important for evaluating the effects of government investment on income changes.

CHAPTER 3

DATA AND METHOD

As indicated in Chapter 2, many previous studies have focused on factors affecting income inequality. Such studies cannot be readily replicated in China since detailed income data had not until recently been published in China. One reason for a lack of published data on income inequality until recently is that the government considered income differences a sensitive issue. The government has established various mechanisms to limit occupational mobility not only within the urban sector but also between the urban and rural sectors. Population migration is also under tight control. These migration policies may, in some instances, have worked against and, in others, favored the perpetuation of income inequalities.

Instead of using characteristics of individuals, such as education or occupation, as determinants of income inequality in China, this research is designed to find out what particular effects central government investment policy has on provincial income changes. Considering the consistent imbalance in government investment between agriculture and industry, it is expected that investment will have different effects on income changes for urban and rural residents. Therefore, income changes for the total

urban and rural provincial population, as well as income gap changes between urban and rural population, are all tested. The effects of other macro-level factors also expected to contribute to provincial income changes were controlled for in the analysis in order to achieve more accurate estimates. Based on discussions in previous chapters, I expect that per capita government investment will have a positive impact on changes in per capita income for total provincial population, for urban residents, and for rural residents. The relation of government investment to income gap change is expected to be positive. That is, high government investment will contribute to a closing of the gap between rural and urban incomes.

Data

The 29 provinces of China are the units of analysis. It would be preferable to use the county as the unit of analysis for this study, but data are not available at that level. Provincial borders are usually rivers and mountain ranges so that provinces have unique characteristics of climate, natural resources and type of economy. Beginning in 1950, each province was encouraged to develop an independent local economy, yet they are still heavily dependent on central input.

Data for two points in time (1981 and 1986) are used in the belief that it takes some time for provincial income levels to change as a result of government investment. The

data used are taken from China's Statistics Yearbook published by the Chinese National Statistics Bureau (1982,1987). Very little is known about the specific sources of data and methods used for collecting the data. There are very limited explanations in the book as to how certain variables are defined and calculated. But the data are considered reliable for the following reasons: 1) In conjunction with the economic reform initiated in 1979, governments at all levels were urged to base their plans and reports on factual information, which also helps local officials to make sensible decisions. 2) Since the National Statistical Bureau sets the standards for any data collected by its counterparts at the provincial level, the data from different provinces are believed to be collected in a similar manner, with the same standards, which makes the data more useful for comparative purposes. 3) Even when some data are collected through surveys, they are usually the results of very large sample surveys which are generously sponsored by the government. Such data are assumed to be representative and adequate. Dependent Variables

Percent change in per capita income between 1981 and 1986 was calculated as follows:

$$\text{percent change in income} = (\text{income}'86 - \text{income}'81) \times 100 / \text{income}'81$$

TABLE 2

Independent, Control and Dependent Variables

Independent and control variables	Dependent variables
Per capita national government investment, 1981	Income change for urban residents
Provincial location (inland vs coastal)	Income change for rural residents
Percentage of total output which is from agriculture, 1981	Income change for total provincial population
	Change in rural-urban income gap ratio

Note: Dependent variables refer to percentage changes
in per capita income and change in income gap ratio
between 1981 and 1986.

Income change variables (all income measures are at a per capita level) calculated by this formula were calculated for the provincial population as a whole, for urban residents and for rural residents of the province. These are three of the four dependent variables. The last dependent variable is percent change in per capita rural-urban income gap ratio. It was calculated for the period 1981-1986, using the following formula (all income measures are per capita measures):

$$\text{percent change in rural-urban income gap ratio} = (\text{rural income}^{\cdot 86} / \text{urban income}^{\cdot 86} - \text{rural income}^{\cdot 81} / \text{urban income}^{\cdot 81}) / (\text{rural income}^{\cdot 81} / \text{urban income}^{\cdot 81})$$

A positive income gap ratio indicates that the difference between rural and urban incomes decreased from 1981 to 1986. The average annual income for both city and rural residents is measured in yuan. The term "city resident" refers not only to workers, engineers and technicians in factories and other production organizations but also to teachers and professors in schools and colleges, doctors and nurses in hospitals and administrative officials at all levels. They all work in the state-owned or collectively-owned institutions and receive monthly salaries and benefits paid by the state. They are all considered to be co-owners of the state-operated means of production. Their dependents are also included in this category.

The term "rural residents" refers to all the people

living in rural areas who work for profit, which is defined as the money they get from selling their surplus produce after submitting the required amount to the government as duties or quotas. Some of them may work as teachers in schools or as workers in small, collectively-owned factories or other collectively owned enterprises in the countryside (including people's communes in 1981; by 1986, the communes had been dismantled). But as long as they do not work for salaries from the government and do not receive benefits provided by the government, they are counted as rural citizens.

Independent and Control Variables

1. Per capita government investment, 1981 (independent variable)

The amount of per capita central government investment in each province in 1981 was used as an indicator of central government involvement. By 1981, national government investment was still the major source of input for local economic developments in China.

2. Geographic location (inland vs coastal) (control variable)

The location of provinces has an impact on infrastructural development for both agricultural and industrial production. Those provinces located along the lower course of the Yangtze River and those along the coast

have been geographically more accessible than other provinces. A comparatively more developed transportation and market system is believed to have positive effects on local economic development. Thus, each province was coded according to its location. This variable is dichotomous. Coastal location was coded as one and inland as zero.

3. Percentage of total output which is from agriculture, 1981

(control variable)

This variable is agricultural output as a percentage of overall provincial output in 1981. It is an estimate of the weight of agricultural production in the provincial economy. It is a gross indicator of the relative weight of agrarian vs. urban-type economic activity in the province.

Method of analysis

Ordinary least-squares regression was used to estimate the effects of the independent variables on the income change variables. Since I have four dependent variables, the results of four separate analyses are reported. The hypothesized effects of independent and control variables are presented in the following equation:

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + e$$

where Y = income change variable in each regression,
 a = constant,

β = coefficients to be estimated,
 X_1 = per capita government investment in 1981,
 X_2 = provincial location (inland vs. coastal),
 X_3 = percent of total provincial output which is
from agriculture in 1981, and
 e = residual term.

Multicollinearity and the effects of outliers were assessed, using appropriate statistical tests.

CHAPTER 4

FINDINGS

The first part of this chapter is devoted to the discussion of bivariate correlations among all variables. In order to reveal how income levels of urban and rural residents change under the influence of government investment and provincial location, some simple calculations based on mean variable values are presented. The last part of the chapter contains the results of the regression analysis.

Bivariate Analysis

The bivariate zero-order correlations among all independent and dependent variables are reported in Table 3. A high correlation between two independent variables suggests that multicollinearity is a problem. However, the results do not indicate unacceptably high correlations among independent and control variables (the correlation between per capita government investment and percentage of total output from agriculture, $-.62$, was the highest of the three correlations).

This test may not have detected all possible multicollinearity problems since one independent variable may be highly correlated with other independent variables in the equation, but not highly correlated with any single one of them (Berry and Feldman, 1985).

Berry and Feldman suggest that "the most reasonable test for multicollinearity is to regress each independent variable in the equation on all other independent variables, and look at R-squares for these regressions; if any are close to 1.00, there is a high degree of multicollinearity present." When I examined the regression results, I found that R-squares for all three regression equations are within acceptable limits with the highest being .49, suggesting that multicollinearity is not a problem.

The bivariate table also shows how the independent and control variables are correlated with each of the four dependent variables. As expected, governmental investment (PCGINV81) has a fairly strong positive relationship with per capita income changes for urban, rural and total population ($r=.60$, $r=.59$, $r=.42$, respectively). Its relation with income change for the entire population is smaller than its relation with income changes for rural and urban populations singly. This may be due to the effects of other variables on income change for provincial population. On the other hand, per capita government investment has a negative relationship with income gap changes, which was not

expected. The coefficient is $-.18$. High capital investment appears to widen the gap between urban and rural incomes. (See also Table 5 for actual mean levels and percentage changes.)

The relationships between the inland-coastal variable (INLACOAS) and all dependent variables are in the predicted direction. Although its relationship with per capita income change for the urban population is relatively weak ($r=.08$), it has a stronger relation with per capita income change for all other income change variables. The difference between its correlations with per capita income change for rural ($r=.46$) and urban residents ($r=.08$) may account for its higher correlation than other independent and control variables with income gap changes (INC GAPCH; $r=.31$). That is, coastal provinces experienced a greater narrowing of urban-rural income differences than did inland provinces (see Table 4 for actual mean figures) for the 1981-1986 period. That is because rural incomes in coastal provinces grew at a substantially greater rate than did urban incomes in those provinces (102% vs. 34%).

The correlations between the agriculture output proportion variable and income change for total population, urban and rural residents are strong and in the expected direction, ranging from $-.26$ to $-.40$.

TABLE 3

Zero-Order Correlations Among All
Variables, with Means and Standard Deviations,
29 Provinces of China

	1	2	3	4	5	6	7
1. INLACOAS	1.00	.39	-.53	.38	.08	.46	.31
2. PCGINV81		1.00	-.62	.42	.60	.59	-.16
3. ECOTYP81			1.00	-.25	-.26	-.40	.003
4. PCINWPCH				1.00	.55	.90	.09
5. URPCINCH					1.00	.39	-.73
6. AGPCINCH						1.00	.30
7. INCGAPCH							1.00
MEAN	0.35	64.7	35.9	73.7	34.1	85.2	0.43
S.D.	0.48	68.6	15.2	17.2	26.4	25.7	0.34

1. INLACOAS = Dummy variable of inland vs. coastal areas.
(inland=0; coastal=1)

2. PCGINV81 = Per capita government investment.

3. ECOTYP81 = percentage of total provincial output from
agriculture

4. PCINWPCH = Percent change in per capita income for
total population, between 1981 and 1986.

5. URPCINCH = Percent change in urban per capita income,
between 1981 and 1986.

6. AGPCINCH = Percent change in rural per capita income
between 1981 and 1986.

7. INCGAPCH = Change in income gap ratio between 1981 and
1986. A positive number indicates that the
rural income mean is closer to the urban
mean in 1986 than in 1981.

The coefficient with rural population income change is strongest ($r=-.40$), which means that the higher the proportion of agricultural output in total provincial output, the slower the rate of income increase for the rural population. The relation between the income gap change ratio and proportion of output which is from agriculture is negligible.

The following two tables should help to clarify some of the discussions above. Mean incomes for both urban and rural residents based on their provincial location status and the level of per capita government investment in each province are calculated and presented in Tables 4 and 5.

Table 4 shows that the mean rural income in the coastal areas had a one third greater increase than that in inland areas (102% vs. 75%), while urban income increases in both coastal and inland areas occurred at nearly the same rate. At both time periods, inland per capita incomes exceeded coastal per capita incomes for those with urban citizenship. It is clear that state wage policy has favored inland areas. The state did not directly control rural incomes in either period. Rural incomes were higher in coastal than in inland provinces. It appears that provincial location has a greater impact on rural income changes than on urban income changes. This is supported by the regression analysis presented below.

As shown in Table 5, those provinces receiving more than 50 yuan (high) government investment per capita have increased their income much faster for both their urban and rural residents than provinces getting less than 50 Yuan (low) a year. This suggests that government investment plays an important role in people's income changes. But high government investment did not lead to as fast a closure in the income gap ratio (28%) as was achieved by provinces with less government investment (41%). Government investment policy does not appear to contribute to a closing of the rural-urban income gap, perhaps because most central government investment goes to industry and not agriculture.

however, these comparisons as well as the bivariate analyses do not provide the basis for formally testing the hypotheses. Regression analysis provides the basis for assessing the effects of each independent variable on the dependent variable when the effects of other variables are controlled.

Regression Results

Results from all four regressions are reported in Table 6. Only those unstandardized coefficients which are twice their standard error are statistically significant. Among the independent variables in the first column, none of the coefficients are statistically significant, and only government investment and

Table 4
Relation between Provincial Location
and Income Changes, 29 provinces of China

LOCATION	Coastal (n=10)			Inland (n=19)		
	mean income		% change	mean income		% change
	1981	1986	(1981-86)	1981	1986	(1981-86)
	(Yuan)	(Yuan)		(Yuan)	(Yuan)	
URBAN	610	827	34%	645	873	35%
RURAL	293	593	102%	210	368	75%
DIFFERENCE	317	234	-26%	435	505	16%
RURAL INCOME AS % OF URBAN INCOME	48%	72%	50%*	33%	42%	27%*

* Indicates reduction in urban-rural income gap between 1981 and 1986 based on difference between the percentage that rural income was of urban income in 1981 and 1986, divided by the 1981 percentage, and multiplied by 100.

Table 5
Relation of Level of Government Investment
to Per Capita Income Change

INVEST- MENT	High (>50/per capita n=9)			Low (<50/per capita n=20)		
	mean income		% change	mean income		% change
	1981	1986	(1981-86)	1981	1986	(1981-86)
	Yuan)	(Yuan)		(Yuan)	(Yuan)	
URBAN	700	1100	57%	603	748	24%
RURAL	280	566	102%	220	392	78%
DIFFER- ENCE	420	534	27%	383	356	-7%
RURAL INCOME AS % OF URBAN INCOME	40%	51%	28%	37%	52%	41%

* (Same footnote as Table 4).

inland-coastal location were related to changes in income of the total population in the predicted direction. However, a comparison of their standardized coefficients shows that government investment is the most important determinant of income changes for the entire provincial population. Note that the inland-coastal variable is almost equally important, which indicates that provincial locations also make considerable contributions to the overall per capita income changes. Yet, the finding that the agricultural output proportion is positively but weakly related to such income changes was unexpected.

When the variable of urban per capita income change (URPCINCH) is regressed on the independent variables, government investment in 1981 is the only one with a significant influence ($b=0.28$) and it is in the predicted direction. The two control variables do not have significant effects (INLACOAS, $b=-7.64$; ECOTYP81, $b=0.21$). And neither one is in the predicted direction. Note that the standardized coefficient for the government investment variable ($\beta=0.73$) is much stronger than that for the other two variables (INLACOAS, $\beta=-.14$; ECOTYP81, $\beta=.12$), which indicates that government investment is the most important predictor of urban per capita income change. The fact that the inland-coastal variable is negatively related to urban income changes may indicate that urban residents in the coastal areas did not experience as great an increase in income as did their counterpart in inland

areas, once government investment is controlled for (the zero-order relationship is weakly positive).

The regression with per capita income change for rural residents, which is presented in the third column, shows a similar pattern to the first regression. Per capita government investment in 1981 (PCGINV81, $b=0.20$) is still the only significant variable and it is in the predicted direction. The relationship of the inland-coastal variable (INLACOAS) to rural income changes is positive as predicted. The direction of relationship between agriculture output proportion (ECOTYP81) and rural income change is opposite to the prediction. The relation is insignificant and weak.

The regression in the fourth column with income gap change as the dependent variable (INCGAPCH) shows that the only significant independent variable is provincial location ($b=0.32$); that is, the income gap narrowed more in coastal areas than it did in inland areas, controlling for per capita level of government investment. The government investment contribution is neither significant--though it approaches significance--nor is the relationship in the predicted direction. Government investment (controlling on inland-coastal location and on agriculture's share of total output) did not contribute to the narrowing of the urban-rural income gap. Table 5 suggests that high government investment contributes less to narrowing the urban-rural income gap than do lower government investment levels.

TABLE 6

Ordinary Least-Squares Estimates of the Effects of Government Policy, Geographic Location, and Agricultural output on Provincial Level Income Changes, (1981-86).

	Change in Income Total Pop	Change in Income Urban	Change in Income Rural	Change in Income Gap
PCGINV81 (S)	0.40	0.73	0.53	-0.34
(U)	0.10	0.28 *	0.20 *	-0.160
S.E. (0.06)		(0.08)	(0.07)	(0.083)
INLACGAS (S)	0.31	-0.14	0.30	0.46
(U)	11.16	-7.64	16.03	0.32 *
S.E. (7.35)		(10.10)	(9.63)	(0.15)
ECOTYP81 (S)	0.17	0.12	0.09	0.04
(U)	0.19	0.21	0.16	0.001
S.E. (0.27)		(0.38)	(0.36)	(0.005)
R-Square	0.24	0.39	0.42	0.20
CONSTANT	56.78	11.07	61.14	0.40

PCGINV81 = Per capita government investment.

INLACGAS = Dummy variable of inland vs. coastal areas.

ECOTYP81 = Percentage of total output from agriculture.

PCINWPCH = Percent change in per capita income for total population, between 1981 and 1986.

URPCINCH = Percent change in urban per capita income, between 1981 and 1986.

AGPCINCH = Percent change in rural per capita income between 1981 and 1986.

INCGAPCH = Change in income gap ratio between 1981 and 1986
Positive numbers indicate that rural income mean is closer to urban mean in 1986 than in 1981.

Note: Standardized Coefficients (S) and unstandardized coefficient (U) are shown with standard error in parentheses (S.E.)

*: Unstandardized coefficient at least twice its standard error.

This is not very surprising, since government investment contributes more strongly to an increase in urban income than it does to an increase in rural income. That is because, as discussed in Chapter 2, government investment is much more oriented to heavy industry than to agriculture. The contribution of agriculture's proportion of output to the urban-rural income gap change is far from being significant. From this regression, one can conclude that provincial location (INLACDAS) is a major predictor of income gap changes within each province.

Plots of standardized residuals for each regression were checked and two outliers were found, one (Jiangsu Province) in the second regression and the other (Zhejiang Province) in the last regression. Since the existence of outliers may bias the results, regressions without the outliers were run. The results of these reanalyses were not substantially different from the results of the full sample; therefore, those regressions are not reported here.

Discussion of Findings

The findings indicate that government investment has a greater effect on income changes than do the other predictor variables in the study. However, government investment has the effect of widening the income gap between urban and rural residents, contrary to the predicted effect. Provincial location affects the income gap changes the most. This is due mainly to the much greater growth of rural

incomes in coastal than in inland areas, while urban income change is not affected by location of province.

Given the fact that government investment is highly correlated with the percentage of urban population in the entire provincial population, it is assumed that government investment in 1981 was directed mainly to more industrialized areas where urban populations are concentrated. The assumption is supported by the bivariate relationship ($r = -.62$) between government investment and agricultural output proportion shown in Table 3.

Clearly government investment has a greater impact on income changes for both rural and urban residents as well as for the entire population than do provincial location and agricultural output proportion. However, its impact on urban income changes is stronger than it is on rural income changes, which may indicate where government investment was mainly concentrated. The fact that urban income changes are strongly related only to government investment while rural income changes have another contributor, provincial location, leads one to conclude that, under the new reform conditions, rural residents are benefiting from being in the historically more developed coastal areas. On the other hand, urban incomes in inland areas were slightly higher in 1981 than they were in coastal areas. And this situation remained the same after all the structural changes between 1981 and 1986.

The positive impact of provincial location on income gap changes is much greater than that of government investment which is negatively related to income gap change. One can conclude that central government investment is not designed to narrow income gaps between urban and rural residents or at least does not have that effect. The influence of agricultural output proportion has been consistently insignificant in every regression. Whatever variance it may explain in income changes is largely shared with per capita government investment (the zero-order correlation between the two is $-.62$.)

Chapter 5

Discussion and Conclusion

The purpose of this thesis was to determine what effect central government investment had on provincial income changes for people with the two kinds of citizenship (roughly equivalent to urban and rural), under the economic reforms of the 1980s in China. Those reforms include the responsibility system in the countryside and the proposed decentralization of decision-making powers from the central government to more local levels including the family itself. At the same time, I controlled for the effects of other possible macro-level predictors, including proportion of total output from agriculture and inland-coastal location.

Implications of Government Investment

Government investment as a major source of input for economic development in each province is still the most important factor in affecting income changes for both urban and rural residents as well as the entire provincial population. But it does not narrow the income gap between urban and rural residents, as was hypothesized. It is clear that the present Chinese government is not taking measures to eliminate or even to decrease the income gap

between urban and rural residents through its investment policy. This is related to the fact that most government investment is urban oriented, thus government has much less direct control over rural income changes than it has over changes in urban incomes.

Economic reforms in urban areas, which were started much later than those in rural areas, have not fundamentally affected the nation-wide salary system. If they had, presumably urban income would have risen much faster in coastal areas, because of the greater resources there, than in inland areas. Urban income increases still basically depend on nation-wide salary policy. The average income for urban residents in coastal areas in 1986 is slightly lower than it is in inland areas and its rate of increase is the same as in inland areas. One can conclude that urban residents in coastal areas have not been benefiting from economic reforms due to the control that government had over the existing salary system for the period 1981-1986, and to a policy, implicit or explicit, of keeping state salaries in inland areas as high or a little bit higher than they are in coastal areas.

As in past Five-Year Plans, government investment continues to favor urban areas (industrial sector), and leaves the rural areas (agricultural sector) to fend for themselves. It is clear that the initial step of economic reforms which started in the countryside in China does not

mean that government policy has reversed its investment emphasis. The industrial sector still enjoys its favourable position in attracting central investment. On the other hand, rural inhabitants have been given considerable freedom under the responsibility system to produce and earn independent of government investment. Hence, the speed of income increase for rural residents exceeds that of urban residents. The income gap between urban and rural residents narrowed in each of the 29 provinces between 1981 and 1986.

Dramatic increases in per capita income for rural residents owes much to the responsibility systems installed in the early 1980s throughout rural China. This system allows the farmers to retain their surplus products after fulfilling production quotas at prices set by the government. They can either sell their surplus to the government at much higher prices than quota prices or sell it on the free market, whichever way they think is more profitable. This system has given farmers substantial work incentives and released productivity potential. As a result, agricultural production has increased dramatically, and farmers' incomes have increased accordingly even without a sharp increase of input from the central government. This means that changes in administrative policy can also lead to income changes.

The greater increase in rural income in coastal areas also indicates that people in rural areas can benefit from

more developed local economies. The sharply increased productivity in farming suddenly freed large numbers of people in rural areas for other economic activities, especially in densely populated coastal areas. based on this, the government has been encouraging farmers to engage in food processing, light industrial production or various low to moderate technology services. People in coastal areas have taken advantage of being close to urban centers (which means closeness to financial and technical resources) to organize their own industrial production, which has turned out to be much more profitable than agricultural production. They were also encouraged to produce high value crops, such as fruits and vegetables, because of a ready urban market at free market prices. Their average income level thus increased much faster than that of their counterparts in inland areas. From Table 4, we can see that average income for rural residents in coastal areas in 1986 is much higher (61%) than that of their counterpart in inland areas.

A new economic policy which emphasizes a higher economic growth rate has been set on its way. Among rural areas of the provinces, government policy through implementation of the responsibility system has contributed to exacerbating inequalities between those areas with a broader economic and technological base and those areas which are less well endowed. The results of this study also suggest that little has changed in the central government investment policies.

The government is continuing its unbalanced investment ratio, which favors industry over agriculture. Surprisingly, inland areas continue to be favored over coastal areas in terms of urban wage policy during the period being studied.

Suggestions for future Studies

For developing more accurate estimates on central policy's impact on income pattern changes, the Chinese province as an unit of analysis seems too big. When data are available, analysis at the county level is highly recommended. Since China has more than 2000 counties which are more homogeneous than provinces, data at this level should more clearly indicate how local situations are related to income changes for different categories of people.

If appropriate data are available in the future, more variables can be included in future studies because the income level is also related to many factors other than those used in this study. For instance, if the urbanization level of each province or county is measured by the number and size of its cities and towns, the variable can more accurately reflect the concept. It would also be useful to directly test the impact of individual workers' characteristics, such as level of education, on income differences.

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GOVERNMENT INVESTMENT POLICY AND INCOME DIFFERENCES

IN CHINA

by

JIE YANG

B.A., Beijing Languages Institute, 1983

AN ABSTRACT OF A MASTER'S THESIS

submitted as partial fulfillment of the
requirements for the degree

MASTER OF ARTS

Department of Sociology, Anthropology
and Social Work

KANSAS STATE UNIVERSITY

Manhattan, Kansas

1989

ABSTRACT

This thesis is designed to identify the particular effects of central government investment policy on geographic income variations in China. Government investment policy has been the key factor determining the direction and rate of local economic development. It was hypothesized that government investment policy, measured by per capita central government investment, has a positive effect on income change in the 29 provinces of China. Income change was measured for the period 1981-1986 for the total population and for the two types of citizenship--the rural and the urban population. It was also hypothesized that the income gap between rural and urban populations would be closed more rapidly in provinces with high per capita investment than those with low investment. It is believed that other possible determinants of income level such as geographic location (inland vs. coastal), sectoral characteristics of the provincial economy (measured by percent of total output from agriculture) are important alternative contributors to income changes. Their effects were controlled in the analysis of government investment policy.

I used ordinary least-squares (OLS) regression to assess the effects of per capita government investment on changes in per capita income for provincial urban and

rural residents and the entire provincial population as well as income gap changes between urban and rural populations.

Results from the regression analysis showed that the government investment policy is still the most important factor in positively affecting income changes for both urban and rural residents. Yet it contributes to a modest increase in the income gap between urban and rural residents. Since government investment is concentrated heavily in the industrial sector, that is not surprising. The strongest predictor of a declining income gap between urban and rural income was geographic location. Rural incomes closed the gap with urban incomes much more rapidly in coastal provinces than in inland provinces, reflecting the considerable ability of peasants in coastal areas to take advantage of the more favorable resource endowment and market opportunities than were available to those in inland areas as the responsibility system was implemented in the countryside.